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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,422	01/16/2002	James J Rathburn	52191-243421	6794

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EXAMINER

TSUKERMAN, LARISA Z

ART UNIT PAPER NUMBER

2833

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,422

Applicant(s)

RATHBURN, JAMES J

Examiner

Larisa Z Tsukerman

Art Unit

2833

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 49-52, 54-77 and 90 is/are pending in the application.
- 4a) Of the above claim(s) 59, 73, 75 and 76 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 49-51, 56-58, 60-66, 68-72, 74, 75 and 77 is/are rejected.
- 7) ☒ Claim(s) 52 and 67 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16-01-02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5, 7, 8. 6) ☐ Other: _____

DETAILED ACTION

Applicant's election without traverse of claims 49-52, 54-77 and 90 in Paper No. 11 dated 07-28-03 is acknowledged.

In regard to claim 59, Examiner notes that claim 59 is not a part of elected specie 17/ Fig.16; independent claim 49 does not include any bonding.

In regard to claim 73, Examiner notes that claim 73 is not a part of elected specie 17/ Fig.16; independent claim 65 does not include any bonding.

In regard to claim 75, Examiner notes that a subject matter of claim 75 does not go with selected specie 17/ Fig.16.

In regard to claim 76, Examiner notes that claim 76 is not a part of elected specie 17/ Fig.16; independent claim 65 does not claim/include any resilient member.

Thus the above claims will not be further treated on the merit.

Specification

The disclosure is objected to because of the following informalities: the disclosure is not sequentially organized and difficult to follow.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 49, 50, 54-58, 60-64 and 90 are rejected under 35 U.S.C. 102(b) as being anticipated by, or, in the alternative, under 35 U.S.C. 103(a) as obvious over Johnson (5645433).

In regard to claim 49, Johnson discloses an electrical connector for electrically interconnecting terminals on a flexible circuit member with terminals on a second circuit member, the electrical connector 20 comprising: a housing 26 having a plurality of through holes 47 extending between a first surface 42 and a second surface 40, each of the through holes defining a central axis; a plurality 22 of elongated electrical contact members 32 positioned in at least a portion of the through holes and oriented along the central axes (not marked, see Col.7, line 1), the electrical contact members 32 having first ends extending above the first surface 42 adapted to couple electrically with the terminals on the (flexible) circuit member 48A, and second ends 38 extending above the second surface 40 to couple electrically with the second circuit member 30 (via 45 with conductive coating 44); and a resilient member 46 comprises a compliant encapsulating material interposed between a portion of the through holes and a portion of the electrical contact members 32 to control movement of the electrical contact members along their respective central axes (see Fig. 4 and Col. 7, lines 62-64 and Col 8, lines 18-19).

Applicant does not positively claim a flexible circuit but should issues as to use with a flex circuit, such use is also seen to be an obvious variation. Flexible circuits are well known equivalent to a rigid circuits.

In regard to claim 50, Johnson discloses first ends of the electrical contact members 32 are attached to the terminals 50/50A on the (flexible) circuit member 48/48A (see Figs. 19 and 20).

In regard to claim 54, Johnson discloses the second surface of the housing includes at least one device site 47, 38 corresponding to the second circuit member 30, as claimed.

In regard to claim 55, Johnson discloses the second ends 38 of the electrical contact members 32 have a shape that corresponds to a shape of the terminals 45,44 on the second circuit member 30 (see Col. 7, lines 25-28)

In regard to claim 56, Johnson discloses the second ends 38 of the electrical contact members are capable of engaging with a connector member selected from the group consisting of **a printed circuit board 30**, (a flexible circuit, a ribbon connector, a cable, a ball grid array (BGA), a land grid array (LGA), a plastic leaded chip carrier (PLCC), a pin grid array (PGA), a small outline integrated circuit (SOIC), a dual in-line package (DIP), a quad flat package (QFP), a leadless chip carrier (LCC), a chip scale package (CSP), or packaged or unpackaged integrated circuits).

In regard to claim 57, Johnson discloses the electrical contact members 32 are one of **a homogeneous** material or a multi-layered construction (see Figs. 1,2,6-8, wherein a cross-section shows a pin 32 of **a homogeneous** material).

In regard to claim 58, Johnson discloses the electrical contact members 32 have a cross-sectional shape selected from one of circular, oval, polygonal, and rectangular (see Col. 6, lines 64-65).

In regard to claim 60, Johnson discloses the electrical contact members 32 are electrically coupled to the (flex) circuit using one or more of **a compressive force, solder**, a wedge bond, a conductive adhesive, an ultrasonic bond and a wire bond (see Figs.19 and 20, Abstract, line 15-16, and Col. 8, lines 47-67).

In regard to claim 61, Johnson discloses the second ends 38 of at least two of the electrical contact members 32 **formed** so as to extend beyond the second surface 40 of the housing 26 by a different amount, as claimed.

In regard to claim 62, Johnson discloses electrical contact members 32 have a larger cross section 34 proximate the first end than at the second end (see Figs. 1-2).

In regard to claim 63, Johnson discloses the plurality of through holes 47 are arranged in a two-dimensional array (see Figs. 16-18).

In regard to claim 64, Johnson discloses the resilient member 46 comprises a compliant encapsulating member elastically bonding the electrical contact members to the housing (see Abstract, lines 12-18 and Col. 8, lines 13-15).

In regard to claim 90, Johnson discloses a method of making an electrical Interconnect comprising the steps of:

providing a housing 26 having a plurality of through holes 47 extending between a first surface 42 and a second surface 40, each of the through holes defining a central axis;

positioning a plurality 22 of elongated electrical contact members 32 in at least some the through holes oriented along the central axes (not marked, see Col.7, line 1), the electrical contact members 32 having first ends extending above the first surface 42;

interposing a compliant encapsulating material interposed between a portion of the through holes and a portion of the electrical contact members 32 to control movement of the electrical contact members along their respective central axes (see Fig. 4 and Col. 7, lines 62-64 and Col 8, lines 18-19).

Claims 65, 69, 70, 71, 74 and 77 are rejected under 35 U.S.C. 102(b) as being anticipated by Grange et al. (5388998).

In regard to claim 65, Grange et al. discloses an electrical connector 10 for electrically interconnecting terminals on a flexible circuit member 14 with terminals on a second circuit member 12, the electrical connector comprising: a housing 50 having a plurality of through holes 62 extending between a first surface 56 and a second surface 54, each of the through holes defining a central axis; a plurality of elongated electrical contact members 20a-c positioned in at least some of the through holes and oriented along the central axes, the electrical contact members having first ends 32 extending above the first surface that are attached to, and electrically coupled with, the terminals

on the flexible circuit member 14' (see Col.4, line 68), the flexible circuit member controlling movement of the electrical contact members along their respective central axes, and second ends 28 extending above the second surface 54 to couple electrically with the second circuit member 12.

In regard to claim 69, Grange et al. discloses the second surface 54 of the housing 50 includes at least one device site 28,62.

In regard to claim 70, Grange et al. discloses the second circuit member 12 is one of a **printed circuit board** (see Col. 4, line 60), a flexible circuit, a bare-die device, an integrated circuit device, an organic or inorganic substrate, a rigid circuit, or a wafer containing a plurality of integrated circuit devices.

In regard to claim 71, Grange et al. discloses the second ends 28 of the electrical contact members comprise one or more of (die level test probes, wafer probes, and) **printed circuit board probes** (see Fig.2, 3).

In regard to claim 74, the electrical contact members 20a-c are electrically coupled to the flex circuit 14' using one or more of **compressive force** (see Col. 5, line 48 and Abstract), (solder, a wedge bond, a conductive adhesive, an ultrasonic bond and a wire bond).

In regard to claim 77, the flexible circuit member 12 comprises electrical contact pads along a second surface thereof 13 (see Col.5, line 48).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (5645433) in view of McMillan et al. (5829988).

Johnson discloses most of the claimed invention except for the (flexible) circuit member comprises singulated terminals. McMillan et al. discloses singulated terminals 212 with a slot 210 around (see Fig.4B and Col. 8, lines 25-39) to create a spring action for better and stronger electrical contact with balls 36. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made and for the same reason to use singulated terminals of McMillan et al. in structure of Johnson.

Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grange et al. (5388998) in view of McMillan et al. (5829988).

Grange et al. discloses most of the claimed invention except the flexible circuit member comprises singulated terminals. **McMillan et al. discloses singulated terminals 212 with a slot 210 around (see Fig.4B and Col. 8, lines 25-39) to create a spring action for better and stronger electrical contact with balls 36. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made and for**

the same reason to use **singulat d terminals of McMillan et al.** in structure of Grange et al.

Claims 68, 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grange et al. (5388998) in view of Lightbody et al. (4528500).

Grange et al. discloses most of the claimed invention except for a compliant encapsulating member elastically bonding the electrical contact members to the housing. Lightbody et al. discloses a compliant encapsulating member 32 **to retain** the electrical contact members 12 into the housing 11. **Therefore, it** would have been obvious to one having ordinary skill in the art at the time the invention was made and for the same reason to include a compliant encapsulating member 32 of Lightbody et al. in structure of Grange et al.

Allowable Subject Matter

Claims 52 and 67 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The Prior Art does not teach or suggests an electrical connector for electrically interconnecting terminals on a flexible circuit member with terminals on a second circuit member comprising a complaint material positioned along a surface of the flexible circuit member **opposite** the terminals of the flexible circuit member.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Takamatsu et al. (4509099), Watanabe et al. (5652608), Ohsawa et al. (6379176), Avakian (3880486), **Sinclair (5427535)**, Fox et al. (4954878), Bentlaga et al. (5099393), Dibble et al. (4976626), Amen et al. (5321884), Yarbrough et al. (47001320), Del Mei (4118090), Swengel (2958064), Hansen (5548488), Nguen et al. (6094115), **Matsunaga et al. (6079987)**, Cowart et al. (5519331), Otsuki et al. (6450821), Distefano et al. (5706174), Angulas et al. (5203075), maurinus et al. (5358412), Grabbe et al. (5125695), **(5173055)**, Pizzeck (3964813).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Larisa Z Tsukerman whose telephone number is (703)-308-6038. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A Bradley can be reached on 703-308-2319. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7722 for regular communications and (703)-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

L.T.
August 9, 2003


THO D. TA
PRIMARY EXAMINER

ho·mo·ge·ne·ous

ho·mo·ge·ne·ous (hō'mə-jē'nē-es, -jēn'yes) *adjective*

1. Of the same or similar nature or kind: "a *tight-knit, homogeneous society*" (James Fallows).
2. Uniform in structure or composition throughout.
3. *Mathematics*. Consisting of terms of the same degree or elements of the same dimension.

[From Medieval Latin *homogeneus*, from Greek *homogenēs*: *homo-*, homo- + *genos*, kind. See heterogeneous.]

— ho'mo·ge'ne-ous-ly *adverb*

— ho'mo·ge'ne-ous-ness *noun*

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